

Appl. No. 10/730,073
Amendment dated: August 21, 2006
Reply to OA of: March 1, 2006

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1(currently amended). A compound semiconductor material for forming an active layer of a thin film transistor device, comprising:

a group II-VI compound doped with a dopant ranging from 0.1 to 30 mol%, wherein the dopant is selected from a group consisting of at least one of alkaline-earth metals, group IIIA elements, group IVA elements, group VA elements, group VIA elements, and transitional metals;

wherein a precursor solution of the compound semiconductor material is prepared by Chemical Bath Deposition, Photochemical Deposition, or Sol-gel process.

2(original). The compound semiconductor material as claimed in claim 1, wherein the group II-VI compound is ZnO, ZnS, ZnSe, CdSe, CdS, HgS, MnS, SnS, PbS, CoS, NiS, or CdTe.

3(original). The compound semiconductor material as claimed in claim 1, wherein the alkaline-earth metal is Mg, Ca, Sr, or Ba; the transitional metal is Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Y, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, La, Hf, Ta, W, Re, Os, Ir, Pt, or Au; the group IIIA element is B, Al, Ga, In, or Tl; the group IVA element is Si, Ge, Sn, or Pb; the group VA element is N, P, As, Sb, or Bi; and the group VIA element is S, Se, Te, or Po.

4(canceled).

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5(original). The compound semiconductor material as claimed in claim 1, wherein the active layer of the thin film transistor device is patterned by Inkjet Printing, Nanoimprinting, Micro Contact Printing, or a spin coating-photolithography process.

6(original). The compound semiconductor material as claimed in claim 1, wherein the thin film transistor device is composed of a gate electrode, a source electrode, a drain electrode, a dielectric layer, and a substrate.

7(original). The compound semiconductor material as claimed in claim 6, wherein the gate electrode, the source electrode, or the drain electrode of the thin film transistor device is made of metals, electrically conductive oxides, or electrically conductive polymers.

8(original). The compound semiconductor material as claimed in claim 6, wherein the dielectric constant of the dielectric layer is more than 3.

9(original). The compound semiconductor material as claimed in claim 6, wherein the dielectric layer of the thin film transistor device is made of inorganic materials, polymers, or a material having a high dielectric constant.

10(original). The compound semiconductor material as claimed in claim 6, wherein the substrate is a silicon wafer, a glass substrate, a quartz substrate, a plastic substrate, or a flexible substrate.

Claims 11-15(canceled).

16(new). A thin film transistor device comprising:
a substrate;
a gate electrode deposited on the substrate;

a dielectric layer deposited on the gate electrode;
a source electrode and a drain electrode deposited on the dielectric layer; and
an active layer deposited on the gate electrode and source electrode, wherein the active layer comprises a group II-VI compound doped with a dopant ranging from 0.1 to 30 mol% and wherein the dopant is selected from a group consisting of at least one of alkaline-earth metals, group IIIA elements, group IVA elements, group VA elements, group VIA elements, and transitional metals.

17(new). The thin film transistor device as claimed in claim 16, wherein the group II-VI compound is ZnO, ZnS, ZnSe, CdSe, CdS, HgS, MnS, SnS, PbS, CoS, NiS, or CdTe.

18(new). The thin film transistor device as claimed in claim 16, wherein the alkaline-earth metal is Mg, Ca, Sr, or Ba; the transitional metal is Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Y, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, La, Hf, Ta, W, Re, Os, Ir, Pt, or Au; the group IIIA element is B, Al, Ga, In, or Tl; the group IVA element is Si, Ge, Sn, or Pb; the group VA element is N, P, As, Sb, or Bi; and the group VIA element is S, Se, Te, or Po.

19(new). The thin film transistor device as claimed in claim 16, wherein a precursor solution of the active layer is prepared by Chemical Bath Deposition, Photochemical Deposition, or Sol-gel process.